AMENDMENTS TO THE CLAIMS

Presented below is a complete set of claims with current status indicators.

1. (currently amended) A method comprising:

sensing respiratory information during a respiratory cycle related to tidal volume and upper airway patency;

based at least in part on the respiratory information, determining if tidal volume is less than a limit; [[and]]

based at least in part on the respiratory information, determining if upper airway patency is inadequate;

if the tidal volume is less than the limit and upper airway patency is not inadequate, calling for diaphragm activation at a stimulation power based on ~~a nondecreasing~~ an increasing monotonic relationship with respect to increasing tidal volume; and

if the tidal volume is less than the limit but upper airway patency is inadequate, inhibiting diaphragm activation.

2. (original) The method of claim 1 wherein the diaphragm activation includes a member selected from the group consisting of phrenic nerve stimulation and diaphragm stimulation.

3. (currently amended) The method of claim 1 further comprising delivering [[the]] stimulation to induce diaphragm activation.

4. (currently amended) The method of claim 3 wherein ~~the delivering the diaphragm activation occurs during inspiration caused in part by intrinsic activity~~ stimulation is delivered approximately at the end of expiration of the respiratory cycle.

5. (canceled)

6. (original) The method of claim 1 wherein the limit relies on historical respiratory information unaffected by Cheyne-Stokes respiration.

7. (previously presented) The method of claim 1 wherein the respiratory information includes information selected from the group consisting of impedance information, plethysmography information, intracardiac electrogram (IEGM) information, neural activity information, pressure information, blood oxygen information, and blood carbon dioxide information.

8. (previously presented) The method of claim 1 wherein the calling for diaphragm activation increases tidal volume.

9. (previously presented) The method of claim 8 wherein the calling for diaphragm activation increases tidal volume to a tidal volume based at least in part on the historical respiratory information.

10. – 18. (canceled)

19. (currently amended) An implantable apparatus comprising:

an input to receive information related to tidal volume; [[and]]

an input to receive information related to upper airway patency; and

a microprocessor configured to use the information to determine if tidal volume is less than a limit and if upper airway patency is inadequate, and if the tidal volume is less than the limit and upper airway patency is not inadequate to call for diaphragm activation at a stimulation power based on ~~a nondecreasing~~ an increasing monotonic relationship with respect to increasing tidal volume, and if the tidal volume is less than the limit but upper airway patency is inadequate, to inhibit diaphragm activation.

20. (original) The implantable apparatus of claim 19 wherein the input includes a connector to connect a lead to the apparatus.

21. (previously presented) The implantable apparatus of claim 19 wherein the information related to tidal volume comprises information selected from the group consisting of impedance information, plethysmograph information, intracardiac electrogram (IEGM) information, neural activity information, pressure information, blood oxygen information, and blood carbon dioxide information.

22. (original) The implantable apparatus of claim 19 wherein the limit relies on historical information related to tidal volume unaffected by Cheyne-Stokes respiration.

23. (original) The implantable apparatus of claim 19 further comprising a pulse generator responsive to the call for diaphragm activation.

24. (original) The implantable apparatus of claim 19 further comprising an output to deliver the stimulation power.

25. (original) The implantable apparatus of claim 24 wherein the output includes a connector to connect a lead to the apparatus.

26. (original) The implantable apparatus of claim 19 further comprising a pulse generator responsive to the call for diaphragm activation, a lead bearing one or more electrodes electrically connectable to the pulse generator and positionable proximate to a phrenic nerve.

27. (original) The implantable apparatus of claim 19 further comprising a pulse generator responsive to the call for diaphragm activation, a lead bearing one or more electrodes electrically connectable to the pulse generator and positionable proximate to a hemidiaphragm.

28. (canceled)

29. (currently amended) The implantable apparatus of claim [[28]] 19 wherein the microprocessor is further configured to adjust the stimulation power based at least in part on the information related to upper airway patency.

30. (previously presented) The implantable apparatus of claim 19 further comprising an output to deliver cardiac stimulation.

31. – 34. (canceled)

35. (currently amended) A method comprising:

sensing respiratory information related to tidal volume;

based at least in part on the respiratory information, determining if tidal volume is between an upper limit and a lower limit; and

if the tidal volume is between the upper limit and the lower limit, calling for diaphragm activation at a stimulation power based on a ~~nonincreasing~~ decreasing monotonic relationship with respect to increasing tidal volume and, if the tidal volume is less than the lower limit, calling for diaphragm activation at a stimulation power based on ~~a nondecreasing~~ an increasing monotonic relationship with respect to increasing tidal volume.

36. (new) The method of claim 1 further comprising if diaphragm activation is called for, continuing to monitor for inadequate airway patency and adjusting diaphragm stimulation power based at least in part on information related to upper airway patency.

37. (new) The method of claim 3 wherein stimulation is delivered approximately at the beginning of the inspiratory phase of a next respiratory cycle.

38. (new) A method comprising:

sensing respiratory information during a respiratory cycle related to inspiratory flow and expiratory flow;

determining if inspiratory flow exceeds a first inspiratory limit and expiratory flow exceeds a first expiratory limit;

determining if inspiratory flow exceeds a second inspiratory limit and expiratory flow exceeds a second expiratory limit;

if inspiratory flow exceeds the second inspiratory limit but fails to exceed the first inspiratory limit, and expiratory flow exceeds the second expiratory limit but fails to exceed the first expiratory limit, calling for diaphragm activation at a stimulation power that is proportional to one or more of inspiratory flow and expiratory flow; and

if inspiratory flow does not exceed the second inspiratory limit and expiratory flow does not exceed the second expiratory limit, inhibiting diaphragm activation.